TELEPHONY

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VOLUME 119

NOVEMBER 9, 1940

NUMBER 19

Amertel

offers

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Answer: *More and more telephone companies say: "We figure costs by the year—not by the foot . . . that's why we know it pays to specify Whitney-Blake," Wire cost plus installation cost, divided by the years of service, gives the real measure of an economical purchase.*

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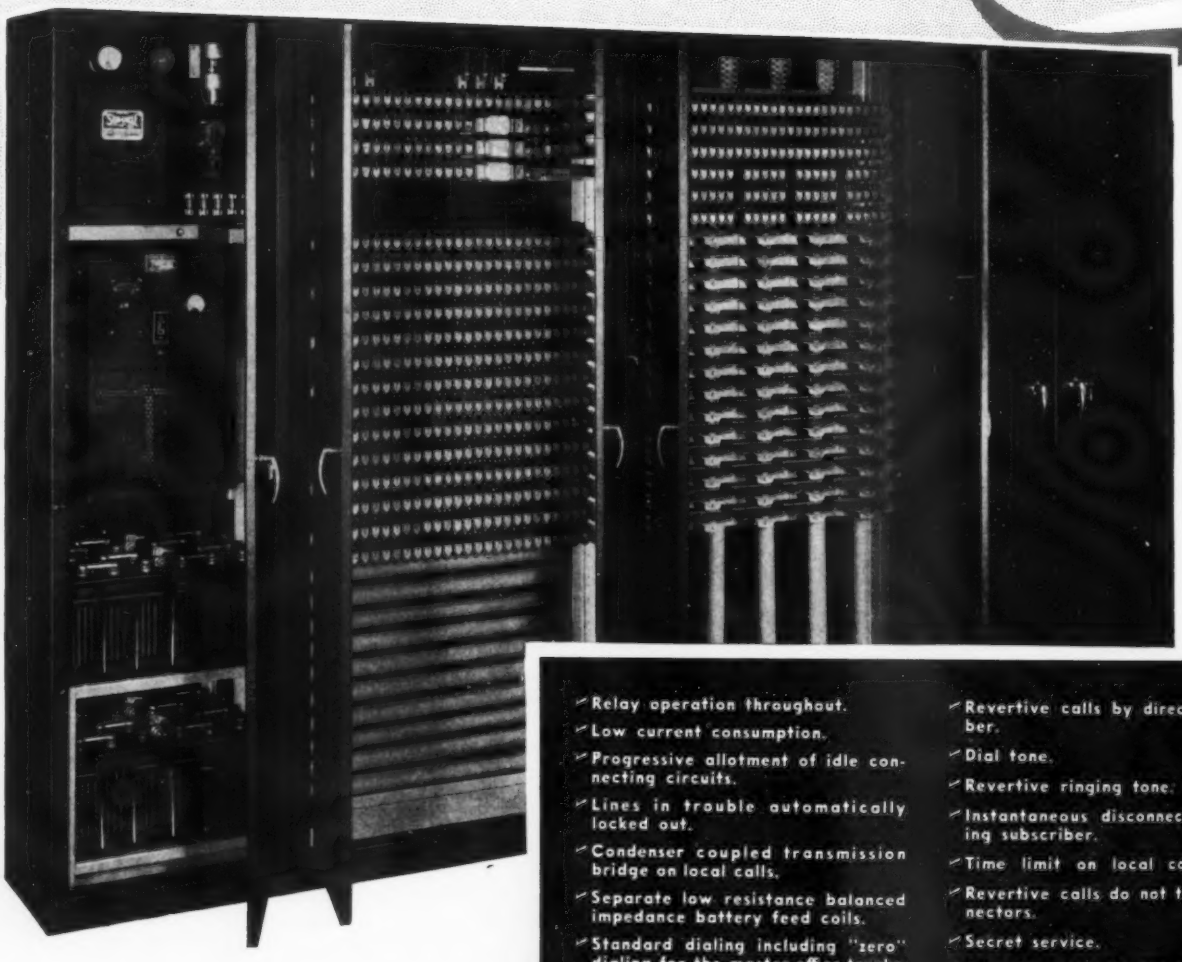

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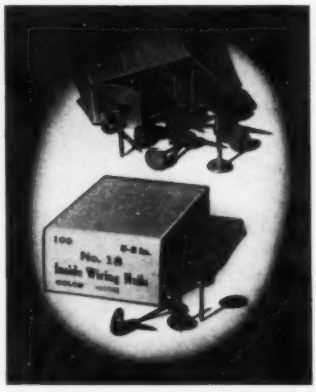

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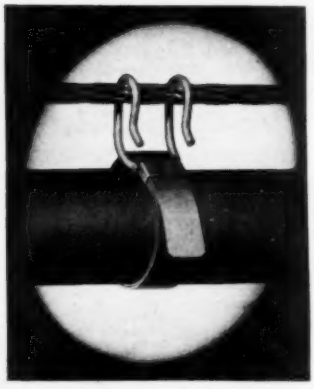

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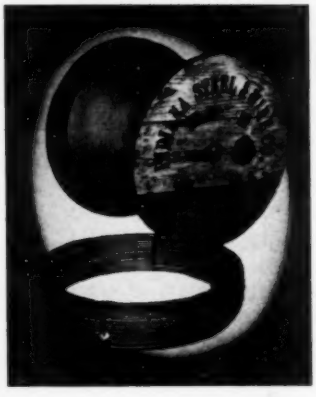
There's no fussy bother in hanging cable with these new cable supports. All you do is wrap the strap tightly around the cable and press down the novel clasp and the job's done. With Zinc Wraps you eliminate any damage to the cable and all wear that threatens when the cable is in contact with the messenger strand. Also, you follow the standard practice of suspending the cable below the strand. Available in 5 sizes.



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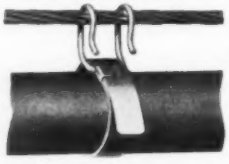

Zinc-Wraps are strong and are designed to allow full hinge motion on clip, thus doing away with the danger of a fatigue break. Easily installed, these efficient hangers hug the cable tightly and will not slide along it.

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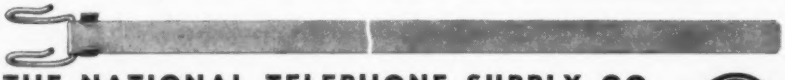

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Telephony

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TRANSMISSION AND ZONING

Of Subscribers' Sets

By W. M. AIKEN
Superintendent of Maintenance, Jamestown Telephone Corp., Jamestown, N. Y.

***IN ORDER FOR** telephone companies to raise transmission standards as economically as possible, this author suggests that care be taken in the planning and distribution of new instrument sets. Adopt standards, make a map of exchanges, and strive to maintain those standards. (Address given before convention of New York State Telephone Association)*

THE PROBLEM of furnishing satisfactory transmission can be divided into three general phases: The selection of transmission standards; the design, construction and layout of a plant which will economically meet these standards, and the maintenance of the plant to keep it within the desired standards.

The term "overall transmission standards" applies to the upper limits for the total effective station-to-station transmission, excluding the effects of impairment due to maintenance conditions. When I refer to db losses, I mean the "effective transmission equivalent which includes the effects of sidetone, distortion, room noise and line noise."

Up to a certain point any improvement in the transmission standards will result in an increased value of the service. However, in most cases the cost of the plant increases as the standard is improved.

The greatly-improved station equipment furnished by all leading manufacturers today not only leads us to the desirability of improving our present standards but opens up an economical way of doing it. This talk will be confined to the improved transmission that can be attained through a planned purchase and distribution of such station equipment.

Chart I shows the general improvement of subscribers' sets over the past 30 years. This chart was made up from a particular make of instrument. However, all manufacturers have improved their sets and they should show a comparable gain in transmission. Referring to the chart, it will be noted that in 1910 a common battery subscriber's set associated with a 24-volt switchboard and a loop equivalent to 3.5 miles of No. 22 gauge cable had a transmission loss of 11.6 db, a receiving loss of 2.0 db, making a total loss of 13.6 db.

In those days, subscribers' sets were made as efficient as the manufacturers knew how; but standards, laboratory equipment and general knowledge have brought about a great improvement in general efficiency since that time. The older sets were quite efficient at 1,000 cycles, but above or below that point they were very poor.

At that time few people could carry on a conversation in a 1,000-cycle key—that explains why it was so difficult to recognize a person's voice over the telephone, while today it is so easy that the phrase "Do you know who this is?" is seldom heard.

During the interval between 1910 and 1928 some improvement was shown. The transmission loss dropped to 8.8 db, the receiving loss increased slightly to 2.6 db, but the total loss was reduced to 11.4 which resulted in an overall gain of 2.2 db.

About 1928 a decided gain was accomplished by the use of the anti-sidetone induction coil. As stated previously, the "effective transmission equivalent" includes the effects of sidetone, distortion and room noise. Heretofore when you talked into a transmitter, your own receiver reproduced your voice loudly, resulting in a normal reduction of the sensitivity of the ear, which is very sensitive organ.

If I should ask you to listen to a pin drop and, instead of dropping a pin should shoot off a gun, many of you would never hear again. A similar thing happened in old type sets; your own voice was reproduced so strongly in the receiver that your

Common battery subscribers' sets associated with a 24-volt switchboard and a loop equivalent to 1.5 miles of No. 22 gauge cable in zone 1; and 3.5 miles of cable in zone 2.

Year	Type	Zone 1 T-R	Zone 1 Improvement	Zone 2 T-R	Zone 2 Improvement
	DESKSTANDS				
1910	Sidetone	5.2	....	13.6	....
1915	Sidetone	4.4	.8	11.9	1.7
1928	Sidetone	3.7	.7	11.4	0.5
1929	Anti-sidetone	— 4.6	8.3	6.4	5.0
1939	Anti-sidetone	— 9.7	5.2	0.7	5.7
1940	Anti-sidetone	—13.7	4.0	— 3.3	4.0
	Total improvement		19.0		16.9
	HANDSETS				
1929	Sidetone	.8	....	9.8	....
1930	Anti-sidetone	— 3.7	4.5	5.8	4.0
1935	Anti-sidetone	—10.7	7.0	— 0.3	6.1
1940	Anti-sidetone	—13.7	3.0	— 3.3	3.0
	Total improvement		14.5		13.1

Chart I. Made up from a particular make of instrument this chart reflects the general improvement of subscribers' sets over the past 30 years. It will be noted that in 1910 a common battery subscriber's set associated with a 24-volt switchboard and a loop equivalent to 3.5 miles of No. 22-gauge cable had a transmission loss of 11.6 db and a receiving loss of 2.0 db.

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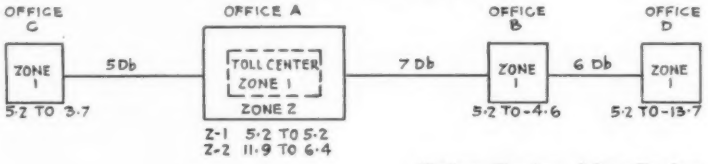
PRESENT AND FUTURE TRANSMISSION STANDARDS

Local Service	Bell System Present	Bell System Future	Upstate New York Present	Upstate New York Future
Between business areas	18	10	....	....
Business to residential areas	21	12	19	9
Between residential areas	24	14	22	12
Toll terminal loss (toll center)	8–9	1.0	8.5	1.0
Toll terminal loss (primary outlet)	8–9	4.0	8.5	4.0
Toll connection via direct trunk	23–26	17–20	23–26	17–20
Information (sub to operator)	....	....	22	....
Intercept service (sub to operator)	....	....	34	....
Intercept service (operator to sub)	....	....	19	....

SCHEMATIC OF FOUR-OFFICE PLANT



	Before Zoning	After Zoning
Between Offices—C to D	28.4 Loss	8.0 Loss
Between Offices—A to D residence	30.1 Loss	7.1 Loss
Between Offices—A to B residence	24.1 Loss	8.8 Loss
Between Offices—B to C	22.4 Loss	11.1 Loss
Between Offices—Residence to residence in zone 2	23.8 Loss	12.8 Loss

Chart 2. Present and future transmission standards. Study of Charts 1 and 2 and the schematic diagram of a four-office plant will show the great advantage in properly distributing new, nearly new and old type sets.

ear became less sensitive, resulting in not hearing the distant party very well.

There was also another factor involved: the fact that generally the loudness of a person's voice is largely controlled, subconsciously, by the volume of sound recorded by the ear. In a noisy room you raise your voice, in a quiet room you soften your voice; and when your voice was reproduced with too much volume in your own receiver, you subconsciously lowered your voice to protect your ear, which resulted in a proportional reduction at the receiving party's set. With the advent of the anti-sidetone induction coil, this was greatly overcome, resulting in a 5.0 db gain (4.1 db in transmission and .9 db in reception).

From 1928 to the present time, the gain has been in general design to improve distortion and quality. In quality we mean a higher fidelity. Instead of the transmitter efficiency centering around the 1,000-cycle band, it has been improved to faithfully transmit all voice frequencies more efficiently. Today, instead of having a 13.6 db loss as shown on Chart I, we have a loss of —3.3, or an overall improvement of 16.9 db since 1910 based on the equivalent of 3.5 miles of No. 22 gauge cable, with a 24-volt battery supply.

This brings us to the study of Chart II, "Present and Future Transmission Standards."

We must all admit the fact that to adopt a proven standard toward which to work is as logical as having a standard measure for liquids or distance. This standard has been arrived at after thousands upon thousands of observations have been made in the field to determine the subscribers' reactions to various effective losses.

As losses increase, repetitions increase, noise becomes more noticeable, complaints of "can't hear" and "can't be heard" increase, service generally is impaired and maintenance goes up. As effective losses are reduced, service is improved and transmitter and receiver maintenance goes down.

Below Chart II a schematic diagram of a four-office plant has been laid out. Office A is the main office located in the business district. This plant is divided into two zones. The subscriber loop loss in zone 1 does not exceed the equivalent of 1½ miles of No. 22 gauge cable, and zone 2 is the residential district with loop losses not exceeding the equivalent of 3.5 miles of No. 22 gauge cable. Offices B, C and D are, within their own boundaries, considered as equivalent in loss to zone 1, and all offices are based upon a 24-volt common battery supply.

A little study of the two charts and the diagram will show the great advantage in properly distributing new, nearly new, and old type sets, and help us plan our future purchases of subscriber sets.

Suppose the old types sidetone sets are now predominant in all offices but that we are buying sets from time to time. What type of set do we need and where should they be installed to do the most good? First let us take zone 1 in office A; this is the business district and our exchange is located here. With the oldest set shown on chart I, zone 1 has a loss of 5.2 db and this will meet all service standards, except future toll terminal loss. Therefore, we will not need to change these sets at this time.

Next take zone 2, office A. To meet all present standards we will need an anti-sidetone set, but not necessarily the latest. So suppose we decide on the 1929 desk stand or handset for this district, say with a loss of about 6.4 db. Making this change will gain 5.5 db.

"B" office comes next, but here we have a 7 db trunk loss to office A which leaves only 1.5 db if we expect to meet present toll standards of 8.5 db. So we pick a set from Chart I, zone 1, and find that any anti-sidetone set will do for the present. Changing these to 1929 desk sets will gain 9.8 db.

Office C is in the zone 1 class also, but there is a 5 db trunk loss to office A which, taken from present toll standard of 8.5 db, will let us choose a set of not more than 3.5 db loss. An ordinary set of 1920 make will be quite satisfactory here for the present.

Office D is also in the zone 1 class, but we have a trunk loss of 6 plus 7 db or 13 db loss to start with and should, therefore, choose a set with a loss of not more than —4.5 db. That calls for a good set, so suppose we install those new anti-sidetone high efficiency sets here with a —13.7 db loss, which will meet future standards as well as present and give us a gain of 18.9 db.

Now, by a little planning and not a great deal of buying, we have greatly improved all toll transmission, and within offices D and B, we have better transmission than we need. This extra transmission efficiency can be economically taken up by using No. 24 or No. 26 gauge cable locally, which is less costly than No. 22 gauge. Office D has been brought up to the future standard by the simple expediency of locating the new sets there as purchasing requires.

In case you are buying new handsets, my advice would be to zone

XUM

your districts and install the sets where they will do the most good, so as to meet the present standards as soon as possible and work toward future standards. For those who choose to buy used sets, my advice is: Buy only anti-sidetone instrument and locate them on your longest loops; it pays many times over in satisfied subscribers.

It is not my intention to ask you to go out and buy hundreds of new sets; that would be much too costly. Other methods could be found, such as loading the trunk lines, which would be less expensive but not always as effective. Today most of us are finding it necessary to purchase new instruments and, in most cases, these sets are being installed at random on current orders. Why do that? A little planning and careful distribution of these sets will automatically improve transmission and, in many cases, save the price of loading coils. As time goes on, these high-efficiency sets will be the only ones on the market. Why not use them to advantage now?

In conclusion, I wish to state that the exchange problem which we have just studied does not include every loss involved, but it does show a fairly good comparison of subscriber-set efficiency. You may not know the effective trunk or loop losses of your various offices. If you wish to determine this loss, I am sure any nearby company having a transmission man available will be glad to help you with your problem.

When you consult him, he will want to know the make-up of your trunk circuits, the make and type of your repeating coils, the make and type of your switching equipment and the amount of your central office battery. To determine subscribers' loop loss, he must know the make-up of the loop with the greatest loss in an area covered by 95 per cent of the subscribers in that exchange.

Some of you may not have any problems at all, others will find a decided value in zoning sets. However, I believe that it is worth while for all of us to adopt standards, make a map of our exchanges, and strive to keep up to those standards.

FRONT COVER

IN THE SOUTH it is not uncommon to see tobacco growing as high as a man's shoulders, and for the front cover this week we have selected a scene of a tobacco field. Close observation will reveal two men working among the tall tobacco plants.

Because telephone conventions are being held soon in South Carolina, North Carolina and Virginia, a salute is given to them this week. Being among the "Original Thirteen" in the Union, these three states have a fascinating historical background and played a heroic part in achieving the independence of the United States.

The production of tobacco in these three states is a great industry and gives employment to thousands of persons. In South Carolina the chief crops are tobacco, cotton and rice. The annual tobacco yield averages about 90 million pounds, while the cotton production is about 700,000 bales.

The forests of South Carolina supply lumber to the East and South, principally yellow pine. Turpentine is an abundant product. The cotton mills are a great and growing textile industry.

North Carolina makes 70 per cent of the cigarettes produced in this country, and 30 per cent of the chewing and smoking tobacco. The state ranks first in cotton mills, cotton spindles, and cotton hosiery production. Forest lands abound, and the state ranks first in the number of native minerals (289). Fishing provides a livelihood for thousands of fishermen.

North Carolina claims the first English settlement in America, which was made upon Roanoke Island, Dare county, in 1587. Virginia Dare was born there on August 18 of that year, thereby becoming the first child of English parentage to be born in the New World.

Virginia has been called the "Old Dominion State" and "Mother of Presidents." The state is dotted with historical markers and prides itself on its Revolutionary heroes, the eight federal presidents born there, and its social prestige.

The state has a goodly share of rivers and mountains, and is quite a vacationland because of its excellent climate, many fine resorts, fishing waters, plentiful beaches, and close proximity of all these to such large cities as Baltimore, Philadelphia, New York and Washington.

Virginia's two chief crops are tobacco and peanuts. Much of the tobacco is grown on red clay lands. The National Tobacco Festival was held in South Boston, Va., in September of this year, attracting thousands of persons (August 10 front cover of TELEPHONY).

In fact, Virginia is a state of many festivals. Garden Week in late April offers visitors an opportunity to see more than a hundred lovely Colonial estates. The Shenandoah Apple Blossom Festival, generally held the last week of April at Winchester, climaxes a month which sees the fragrant, pink-white blossoms of 11,000,000 apple trees in the state. The affair includes tours, a pageant, parades, balls and the coronation of the queen.

Virginia's Dogwood Festival at Bristol, usually in early May, marks the arrival of the state's dogwood blossom season. A coronation, parades, and a pageant do homage to Virginia's state flower. Garden clubs throughout the state have caused millions of dogwood to be planted along the highways and in public places.

These comments only touch upon the varied and interesting backgrounds of South Carolina, North Carolina and Virginia where telephone men have completed plans for attending their annual conventions. In recent years the Independent telephone business in these states has expanded with their increasing business and social development. The South Carolina association will meet at the Wade Hampton Hotel in Columbia, November 11 and 12; the North Carolina association has scheduled its meeting at the Sedgefield Inn, between High Point and Greensboro, November 14 and 15, while members of the Virginia association will convene at the Roanoke Hotel, Roanoke, November 18 and 19.

Telephones in Chicago Reach New High Record

Telephones in use in Chicago at the end of September totaled 1,018,239, a new high record and making the 14th consecutive month to show a gain compared with the preceding month, according to the Illinois Bell Telephone Co.

The September station gain totaled 3,803, as compared with a gain of 1,737 in the preceding month and an increase of 3,977 in September last year.

For the first nine months this year there was a net gain of 21,583 telephones, compared with an increase of 17,849 in the corresponding period last year.

The record number now in service in Chicago of 1,018,239 contrasts with 979,662 a year ago, a gain of 38,572 during the 12-month period.

XUM

in the Nation's Capital

by Francis X. Welch

Special Washington, D. C., Correspondent for TELEPHONY

IT IS PREDICTED that within the next 20 years Uranium-235 (or some other source of energy-releasing property comparable with it) will be isolated in practicable commercial form. . . . Communication and other utility companies will have ample time to worry over its effects upon them

AS THESE lines are written, literally on the eve of the national election, about the safest thing a Washington correspondent can do is to get away as far as possible from the scene of the crime and discuss matters of pure science. Hence the following little dissertation on that mysterious material which is getting such a tremendous build-up these days—Uranium-235.

Ordinarily, one expects such a complicated thing as the atomic theory to be restricted more or less to scientific journals. But here is a case where feature writers have gotten way ahead of the experts. Articles have appeared in such lay publications as The Saturday Evening Post and Collier's. Even New York newspapers have given us vivid accounts of a race now under way between the democratic and totalitarian scientists to be the first to capture the elusive energy which is supposed to be flying around at a tremendous rate in the ubiquitous atom.

And to justify the discussion in this department there seems to be both a Washington and a utility angle to the current publicity being given to Uranium-235. The Washington angle was merely an accident of location, brought about by a meeting of scientifically-minded gentlemen, including several Senators who heard James O'Neal, science editor of the New York Herald Tribune, predict an early and untimely end to the public utility industries as we know them if, as, and when Uranium-235 is reduced to practical use.

Mr. O'Neal's remarks were probably directed principally at electric power and secondarily at the gas utilities. But if things should come to pass as he and other scientific writers visualize them, on the day Uranium-235 is broken to a man-made harness, communications and transportation utilities (including, of course, the telephone) could scarcely escape the impact.

Picture a civilization in which a steamship could be driven around the world half a dozen times on the energy generated from a handful of snow. Picture the immediate effect on utilities of a house which could be lighted, heated, refrigerated and otherwise serviced for a month's time by energy developed from an old cigarette butt dropped into some kind of a jim-crack of a metal box located somewhere down in the cellar where the furnace used to be.

Energy would be so cheap that average working hours could be cut down to 40 minutes a week instead of 40 hours a week. We would have to spend our time sitting around watching the food being pushed up out of the ground under our very nose, while we talked about the good old times when life was tough and a fellow had to work for a living. Some of these science writers are even beginning to worry about what we will do with all our leisure time when the new Utopia comes to pass.

We will have so much of it, they say, that we will probably get into terrible fights with one another and go around getting into other trouble, unless some system is devised to take care of the extra leisure and keep us out of mischief. For reasons which appear to your correspondent to be entirely incomprehensible, this problem of finding new outlets for the sudden leisure of mankind is worrying our city desk scientists to such an extent that they feel Congress ought to begin looking into the matter. The problem appears to be so pressing that we may have to start out by reviving organized games and crossword puzzles.

BUT WHOA and back up, gentle reader, before you take another pull on that pipe. Let us calm down for a minute and see just what is at the bottom of all this literary hashish that threatens to knock civilization, as we know it, right out from under our feet 1,000 times more effectively than the combined bombing squadrons of warring Europe.

Uranium, it seems, is our heaviest metal and can be found in the raw ore state in a number of places, including Canada and our own Rocky Mountain section. Some time ago scientists discovered that the atomic weight of a given element is not necessarily the same for all the atoms which it contains. There are a certain number of abnormal or freakish atoms which occur in all elements that may be lighter or heavier than the general run-of-the-mill. In this class is the so-called "heavy water" which was developed in the Columbia University laboratories some time ago, and which received wide publicity in the newspapers at the time.

XUM

Technically, these freakish atoms are called isotopes. They are comparatively rare in any element, but in Uranium they seem to be more vulnerable to isolation than in other elements. Furthermore, the isotope known as Uranium-235 (the figures refer to a weight measurement which compares with 238, the weight of the normal Uranium atom) is supposed to have special qualities.

Without going into a technical discussion, the scientists feel that they can split up the nuclei of Uranium-235 atoms by bombarding them with slower-moving neutrons. When this happens, new neutrons released as a by-product of the explosion would be converted into pure energy. This follows the concept laid down by Einstein's complicated theory of relativity which declares that *mass is energy.* Not only that, but according to Einsteinian mathematics, the amount of energy so released would exceed by several million times the energy obtained from the simply mechanical process of burning coal of a similar amount.

(If you are mathematically minded, you may already be familiar with Einstein's conclusion: "If a body gives off energy, L, in the form of radiation, its mass is diminished by L/c^2." The symbol "c" stands for the velocity of light.)

Theoretically, the scientists have it all worked out, except for the actual mechanics of catching up with the fast-moving neutrons that would be blasted out of the atom in the form of terrific energy. The advocates of this atomic reduction process, however, think they have a device in the form of a water jacket surrounding the site of the original explosion. They expect that the released neutrons would be slowed down as they passed through the water and release their water in the form of terrific heat which would make steam.

Furthermore, they think that, in this way, the process of conversion would be self-controlling by regulating the amount of water in relation to the Uranium.

You may wonder, if you have not been reading about these new laboratory adventures in the realm of Uranium-235, just how smashing the atom is so firmly based on Einstein's theory. And it would certainly be presumptuous for this writer to attempt even a sketchy analysis of the theory of relativity. But the general effect of it can be understood with a little head-scratching. Here goes!

JUST AS the theory of atomic conversion is based on Einstein's relativity, the latter, in turn, is based on a rather simple experiment made by two American astronomers late in the 19th century. This is known as the Michelson-Morley experiment and it is all done with mirrors. The idea is to release one beam of light at right angles with another beam of light. Now by placing mirrors at the end of the two paths (of equal length) so as to reflect the beams back to a central point of observation, it is possible to measure (from the angle of the third beam or "interference fringe") the time consumed by each beam in making the trip.

The idea of Michelson and Morley was to measure the absolute velocity of light according to the principles laid down by Newton. This could be done by measuring the speed of a moving object with relation to an object absolutely at rest. The ether

FLINT

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

WHAT IS FLINT? It is a very hard variety of quartz which strikes fire with steel. When the word is applied descriptively, it means anything extremely hard, unimpressible and unyielding.

Hetty Stone, operator with 25 years' experience to bolster her hard-as-flint authority, was Hocum's chief operator. She had seen operators come and go, but never had made one of them feel natural or happy in her work.

"How did Hetty come to be chief operator, much less even an operator at Hocum?" operators in other towns used to wonder. This is how it happened: Her father when dying urged his only relative —a brother, also alone in the world—to give her employment in his telephone exchange. "What else could he have done?" the brother was wont to ask himself later. Hetty, his ungrateful niece, took over the office and the old man's authority. She clashed with his will, and won out, because it took too much out of him to buck the ruthless girl.

"She wears me down," he used to exclaim wearily. After he was gone people sometimes said she had, indeed, worn the old man down to his grave. What surprised everyone was that he left all personal property to her. Well, after all, she was his brother's child, however ungrateful.

Was she thankful? No, she decidedly was not. She blamed him for everything wrong about his method of handling the business. People had always liked the old man. Why *couldn't* she let him rest so long as he no longer was present to protect his name? "Poor management!" with strong emphasis, was her favorite expression.

Enough of her!

Showing kindness to an ungrateful person is like trying to make an impression on flint.

Someone has said that flint may be melted under the right heat; but an ungrateful heart can rarely be softened even by the strongest, noblest flame.

Here is one of my favorite quotations:

"If you should give me a dish of sand, and tell me there were particles of iron in it, I might look for them with my eyes, and search for them with my clumsy fingers, and be unable to detect them; but let me take a magnet and sweep through it, and it would draw to itself the most invisible particles by the mere power of attraction.

The unthankful heart, like my finger in the sand, discovers no mercies; but let the thankful heart sweep through the day, and as the magnet finds the iron, so it will find, in every hour, some heavenly blessings—only the iron in God's sand is gold."—Beecher.

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(through which the light beams move) is, according to the Newtonian concept, absolutely at rest.

Therefore, Michelson and Morley figured that the beam that was directed along the path of the earth's motion would show a difference as compared with the beam directed along the path at right angles (thereby escaping any effect of the earth's motion). Imagine their surprise when they found out that there was no difference at all. They rotated their apparatus, refined it, elaborated on it, and in subsequent experiments took it up to great heights and down to great depths below sea level, but the result was always the same—negative.

In other words, the experiment failed to show any influence of the earth's motion upon the velocity of light. This meant that there isn't any such thing as absolute velocity at all since there isn't any such thing as a body or observation point absolutely "at rest." Everything is relative. The velocity of light depends entirely upon the relative position of the observer. For example, a candy butcher walking through a train of cars at five miles an hour is traveling at the speed of five miles an hour with respect to a passenger sitting in a coach seat.

But if the train is traveling at the rate of 60 miles an hour, the candy butcher appears to be moving at the rate of 65 or 55 miles an hour, from the point of view of a man standing along the railroad track (depending on whether the candy butcher is moving toward the locomotive or the caboose). And to an observer on another planet, the candy-butcher's speed would be further complicated by the relative velocity and direction through space of the earth and the planet from which the other observation is made.

And so on and on. Thus, every observation is purely relative *because there is no observation point anywhere in the firmament which can be considered absolutely at rest.*

This discovery was just as era-shaking as the hypothetical apple which fell on Isaac Newton's head. It led to a later elaborate theory by Einstein, then a professor of physics at the University of Bern, Switzerland. He worked out mathematical and geometrical formulae for measuring relative velocity. That is why the scientists claim to know so precisely how many million times an amount of energy can be obtained from a given atom, if the tiny atomic system is blasted out of its own relative orbit and released *in the form of energy relative to our own universe.*

COMING CONVENTIONS

South Carolina Independent Telephone Association, Wade Hampton Hotel, Columbia, November 11 and 12.

North Carolina Independent Telephone Association, Sedgefield Inn, between High Point and Greensboro, November 14 and 15.

Virginia Independent Telephone Association, Roanoke Hotel, Roanoke, November 18 and 19.

Missouri Telephone Association, Muehlebach Hotel, Kansas City, November 18 and 19.

Kentucky Independent Telephone Association, LaFayette Hotel, Lexington, December 3 and 4.

Texas Telephone Association, Texas Hotel, Fort Worth, March 19, 20 and 21, 1941.

EINSTEIN'S theory of relativity and its resulting mathematical implications caused a revolutionary upset in the scientific world. It not only upset preconceived principles laid down by Newton in his law of gravitation, but it extended into other spheres of physical science, including that branch concerned with the atomic structure of physical material.

However, after various tests during which it cleared up previously unanswered scientific puzzles (such as the strange behavior of the planet Mercury in wobbling around its orbit) most scientists today seem to accept the theory as a theory.

But assuming that there is that much latent energy in the atom, the mechanics of releasing it as a practical operation have heretofore been the stumbling block. Dr. Robert A. Millikan of the California Institute of Technology began experiments with atomic energy 20 years ago and predicted that it would never be put to practical use because it took more energy to smash the atom than would be released when the atom was smashed.

This was true when an ordinary sample of Uranium was used in the experiment because the other or "normal" isotopes blanketed the energy released by the freakish U-235. But last May it was announced that a tiny amount of 235 had been isolated at the University of Minnesota and at the General Electric Co., and that pioneer experiments at the physics laboratories at Columbia University, under the direction of Professor John R. Dunning, had determined it to be capable of yielding such energies that one pound of it, if it could be obtained in pure form, would provide a power output equivalent to that of 5,000,000 pounds of coal or 3,000,000 pounds of gasoline.

But don't fly off with the idea that capturing atomic energy is just around the corner, notwithstanding the Sunday supplement pictures you see of the huge cyclotrons being completed for atom-smashing duty.

Gano Dunn, who is a member of the electric power committee of the National Defense Commission, and president of the J. G. White Engineering Corp., is probably one of the most optimistic practical engineers interested in the new work. He has predicted that it would take from 10 to 20 years. He said that not only are there about 300 scientists looking for a new and cheaper way to isolate Uranium-235, but that it is quite possible that isotopes of cheaper metals, such as ordinary iron or lead, will be discovered which will have energy-releasing properties comparable to Uranium-235 and which will be easier to separate from their ores.

Even if the practical problem is solved, the impact upon industrial organization is not likely to be abrupt. Some scientists say that the first one who succeeds in smashing the Uranium-235 atom will in all probability be electrocuted together with everyone around him. This has led the feature writers to predict that the actual smashing will have to be done in some remote place and transferred in the form of high voltage electric energy and distributed through existing electric power systems.

The direct upheaval on the communications business is just too much for one mind to cope with. Since the prospect seems to be at least 20 years away, it is presented here at this time by your correspondent as a problem that can be safely worried over as a counter-irritant to the election results. In other words, if you think you have troubles now trying to find out where we are or where we are going, consider what an awful headache lies ahead for the next generation.

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KELLEY McNISH, of Bristol, who was recently named president of the Inter-Mountain Telephone Co., has been elected a vice-president and a director of the Tennessee Independent Telephone Association.

W. G. SNAPP, of Bristol, who was elected secretary-treasurer and a director of the Tennessee association at annual meeting, is auditor of the Inter-Mountain Telephone Co.

B. H. PIEPMEIER, of Cookeville, who has been ably serving as secretary-treasurer of the Tennessee association, was elected to the presidency at recent convention.

Another Yearly Milestone

Marked by Tennessee Meeting

WITH AN EYE particularly on the problems facing small companies, Independent telephone people in Tennessee held their annual meeting recently in Nashville—the best since the association's organization

MORE THAN 100 Independent telephone men and manufacturers' representatives attended the annual convention of the Tennessee Independent Telephone Association at the Hermitage Hotel, Nashville, on October 28 and 29. Officials of the association report that this year's meeting was the outstanding gathering since the founding of the organization in 1935.

The convention was held in the main assembly room of the hotel. This hall was large enough both for the meetings and for exhibit space, thus resulting in the maximum convenience to exhibitors and to convention visitors.

The morning session of the first day featured addresses by President L. E. Crawley of Bruceton and Louis Pitcher, executive vice-president of the national association. Mr. Pitcher reported on national association activities and stressed the importance of the state associations in the program of the Independent industry. Mr. Pitcher's speaking ability won him the honor of being guest speaker at the Nashville Exchange Club on October 29.

Starting off the afternoon program on the first day of the meeting was an interesting discussion of the "Rural Program for Independent Companies," given by Leon Jourolmon, member of the Tennessee Railroad & Public Utility Commission. Mr. Jourolmon emphasized the importance of developing and extending the rural lines, and the part they play in a complete and effective community telephone system.

Opening a group of talks on the problems of small exchanges, Miss Hattie Walker of McMinnville presented a discussion of commercial problems in the smaller companies. She was followed by W. J. Holladay of Cookeville, who spoke on "Collection and Sales at Small Exchanges," and W. G. Snapp of Bristol, who discussed accounting problems and records. The program was concluded with a talk on "Handling the Public," by Ira L. Knight, of Milton.

The second day of the convention was taken up by round table discussions of various problems pertaining to plant and traffic. Miss Leitha Harris of McMinnville, traveling chief operator of the Southern Continental Telephone Co., presided at the traffic session, while J. E. Sexton, manager of the Inter-Mountain Telephone Co. exchange at Kingsport, led the discussion of plant problems.

Following the round table discussions, officers were elected for the ensuing year. B. H. Piepmeier of Cookeville, who was formerly secretary-treasurer, is president and a director for the coming year, while W. G. Snapp of Bristol was elected secretary - treasurer and director. Other officers and directors include:

Ira Knight, Milton, vice-president and director; D. Kelley McNish of Bristol, vice-president and director; J. J. Odle of Parsons, vice-president and director; and J. O. Neelly of

(Please turn to page 17)

Alabama Independents Register Interest and Growth

EXPANDING ACTIVITY and increasing membership feature annual meeting of Alabama Independent Telephone Association. Information sought and obtained on many matters by interested attendants

IT WAS the consensus of those attending the annual convention of Alabama Independent Telephone Association that, although a wonderful time was had by everyone, the idea of securing all information available was prevalent. The meeting was held at the Jefferson Davis Hotel in Montgomery on October 31 and November 1.

Larger and better exhibits were displayed by a greater number of manufacturers who were well pleased with seeing the largest crowd ever to attend the Alabama convention. On the other hand, the operating people showed their appreciation to the manufacturers by reviewing the exhibits and discussing the merits of the equipment, materials and supplies with the manufacturers' representatives.

Officers and directors were elected as follows:

President, Jas. N. Cox, Jr., Alabama Telephone Co., Fayette; secretary and treasurer, Fox Henderson, Standard Telephone & Telegraph Co., Dothan; vice-presidents—G. A. Crenshaw, Greenville Telephone Exchange, Greenville; B. H. Stallworth, Monroeville Telephone Co., Monroeville; H. W. Vaughan, Alabama Telephone Co., Fayette, and Wasson Harmon, St. Clair County Telephone Co., Pell City.

Directors: G. R. McKelvey, Dothan; Jas. N. Cox, Sr., Fayette; F. W. Kuhn, Troy; W. H. Vaughan, Floralo; J. M. Dean, Union Springs; P. G. Mathis, Elba; Lonnie Cowan, Opp; R. C. Corr, Oneonta, and E. E. Survant, Foley.

The first session was called to order Thursday morning, October 31, by President G. R. McKelvey of Dothan. In his welcoming address, Mr. McKelvey stressed the importance of all operating companies subscribing to the telephone trade journals. He clearly brought out that in these magazines will be found the latest telephone news, as well as all kinds of national and state legislative acts which may affect the telephone companies; plus information on developments of latest equipment.

G. R. McKELVEY of Dothan, in his annual address as president of the Alabama association, emphasized the rural telephone problem and stressed the need of cooperation in the national preparedness program.

It was emphasized that a program of rural telephone development and maintenance of service to the small rural isolated areas was a definite problem to the industry, but that we must attempt to cooperate with the government in national preparedness if we expect them to stay out of our business in case this country becomes involved in war.

President McKelvey also encouraged managers to make their purchases at once, due to the increase in prices going into effect soon.

Upon the completion of Mr. McKelvey's address, Secretary-Treasurer Jas. N. Cox, Jr., of Fayette, gave a report showing that the association had lived within its means and was in satisfactory financial condition. He also expressed his appreciation for the response he had received during the past year when he had occasion to call on the companies to help in association matters.

Mr. Cox told the members that this was their association, that the officers were elected to help them, and that members should not hesitate to contact them with their problems.

The secretary also brought out the fact that the association had increased its membership this past year by adding 10 new members and three new associate members.

Following the secretary's report, President McKelvey introduced Louis Pitcher of Chicago, Ill., executive vice-president of the United States Independent Telephone Association, who made a splendid address on "National Association Activities."

After telling of the many things accomplished by the association last year, such as new toll contracts with the Bell companies which increased the compensation of the Independents more than $2,700,000, and the exemption of the small telephone companies from the Wage-Hour law, Mr. Pitcher asked that all companies fill out the questionnaires sent out by the national association, as well as informing the association of any employes drafted by the U. S. government.

He also assured the operators that the national association is eager and willing to give advice or aid in obtaining financial assistance in the event an army camp is located in their territory.

After following certain routine business, the convention was addressed by Charles A. Stair of Atlanta, Ga., vice-president of the Southern Bell Telephone & Telegraph Co., on "Rural Development in Regard to National Defense."

Mr. Stair reviewed the progress that had been made by Southern Bell and other companies in building rural lines, but warned that in the South especially, we must prepare more than ever and be ready to act quickly in case of an emergency. He also warned the executives to impress upon their employes the danger of repeating any news they may hear of anything

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pertaining to the location of important equipment, as a precautionary measure against sabotage.

The convention session in the afternoon opened with the report by the chairman of the nominating committee. The names of the officers and directors who were then elected to take office for 1941 have been given previously.

The newly-elected president, Mr. Cox, Jr., was then called upon. He pledged his attention to serving the association to the best of his ability, and asked that the members cooperate for a banner year. A bulletin will be sent out every month informing the members of important news, and Mr. Cox asked the members to inform the officers of any new plants, rates, or changes taking place in their territory during the coming year.

Hugh White of Montgomery, president of the Alabama Public Service Commission, addressed the convention on "The Viewpoint of the Commission." He stressed the importance of good public relations, warning the telephone people not to think they were separate from the public because, he said, they were a part of the public.

In closing Mr. White left this thought: "It is the human element that makes a success of your business. Your equipment may be perfect, but without good personal relations there will be complaints."

Jas. N. Cox, Sr., made a motion that the Alabama association go on record as expressing its appreciation to Mr. White for his services and letters which helped to amend the Wage-Hour law. Louis Pitcher of Chicago, Ill., seconded the motion and asked that the name of the United States Independent Association also be added to the resolution.

JAS. N. COX, JR., of Fayette, one of the younger generation in the Independent field, was elected president of the Alabama Independent Telephone Association.

Following Mr. White's address, prizes were awarded for the oldest and most unusual telephone brought to the convention. Everyone enjoyed examining and looking at the old telephones put on display. Fox Henderson won first prize with D. W. Eiland taking second prize.

As the last speaker of the convention, W. A. Steadman, Alabama manager of Southern Bell Telephone & Telegraph Co. and also the newly-elected president of the Alabama Chamber of Commerce, gave a very interesting address entitled "Telephone Topics." Among the many interesting statements by Mr. Steadman, the most important was that rates could not be too high if the telephone companies give the right kind of service.

One of the most enjoyable banquets ever held by the Alabama Independent Telephone Association was on Monday evening, October 31. It was the opinion of many that the spirit prevailing throughout the programs and banquet far exceeded that of any association convention they had ever attended.

Tuesday morning, November 1, was set aside for visiting with the exhibitors, and adieus as the association's best convention passed into history.

▼ ▼

Rural Telephone Work at Kansas State College

A program is now being prepared by Prof. R. G. Kloeffler for another two-day school at the Kansas State College, Manhattan, Kans., November 29 and 30. Those Kansas telephone men who attended the school last December requested a "repeat" school this year.

The school affords an excellent opportunity to obtain fundamental knowledge in the construction, repair and management of rural telephone systems.

▼ ▼

October Station Gain of Bell System

The American Telephone & Telegraph Co. reports its principal subsidiaries had a gain of about 100,900 telephones in service during October. This compares with gains of 109,200 in September and 86,900 in October, 1939.

For the first 10 months of the year there was a net gain of 747,800 telephones against 614,300 for the corresponding period last year.

One of the largest of the subsidiaries, New York Telephone Co., reported a gain of 5,475 stations in October, compared with 5,985 a year ago. For the first 10 months of the year stations increased by 72,858, compared with 60,576 in the 1939 period.

CARL D. BROREIN (right), new president of the United States Independent Telephone Association, was Florida's first purchaser of the recent stamp honoring Alexander Graham Bell. He is shown obtaining a sheet of the 10-cent stamps from POSTMASTER EDGAR WALL (left) and CASHIER R. W. SANFORD, of Tampa, Fla. Mr. Brorein, president of the Peninsular Telephone Co., is also president at this time of the Florida Telephone Association.

▼ ▼

ANOTHER YEARLY MILESTONE MARKED

(Concluded from page 15)

College Grove, W. F. Corman of Collierville, James N. Cox of Cookeville, and H. A. Stoker of Gleason, directors.

The program of the two-day meeting was concluded with a complimentary luncheon given by the association. The after-dinner speech by Dr. W. B. Boyd of Cookeville proved to be one of the outstanding talks of the entire convention. Speaking on "The Long Distance Call," Dr. Boyd inspired every one of his hearers with a desire to go forward with greater zeal and determination to give better service, whatever his part may be in the industry.

Everyone who attended the convention expressed appreciation of the helpful suggestions which had been received and the pleasant associations which had been made during the meeting. It was agreed that the gathering was an outstanding success.

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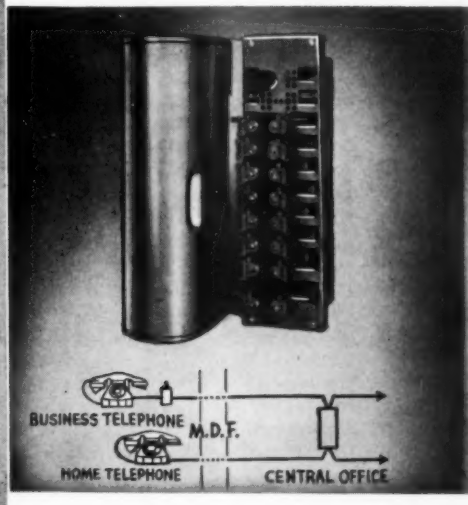
to supp ormation on particular

SWITCHING KEY

For connecting one telephone to several lines, and similar office and secretarial applications. Furnished with locking lever key and in various spring combinations.

THE MONOCHIME

A single-stroke gong of pleasant tone operating directly from the ringing current. Available for manual, magneto and automatic use.



SUBSCRIBER'S TRANSFER SERVICE

Permits all calls to office or business telephone to be switched to residence telephone after office hours, on Sundays and holidays, etc.

LOUD RINGING BELL

Available in various models, for indoor or outdoor use, and for straight line or harmonic ringing. Prospects include Outdoor Taxicab Stands, Lumber Yards, Garages, Railroads, etc.

THE EXTENSICORD

An elastic, stretchable cord which neither kinks nor curls. Doesn't disturb papers on the businessman's desk.

TWO-LINE MONOPHONE

Permits holding one line while making a call over the other. Suggest the use of this telephone by including it in wiring plans for various secretarial services.

XUM

The Operators' Corner

SUGGESTIONS given for more efficient operating use of toll lines. Series No. 422

By MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

EFFICIENT operating use of toll lines is always important, especially when toll traffic studies are in progress to determine if additional toll circuits are required in order to afford adequate facilities for rendering satisfactory long distance telephone service.

In making these so-called toll traffic studies, it is assumed that operators are following prescribed standard operating practices. Failure to do so may prove costly to the telephone company if an additional toll circuit is provided when the facilities in use are adequate if properly used.

An operator may be of the opinion that the recording of a toll call, for example, has no effect on the proper usage of toll circuits. How about the delay experienced when a wrong number is recorded and a special operator is reached at the distant office? Or a wrong number is reached due to an illegible or careless ticket entry? Recording an incorrect routing may result in delay by reaching a wrong destination. The accuracy of the recording of the call directly affects the use of toll circuits.

The work of the Outward operator also has an important bearing upon the efficiency with which the toll line plant is used. Failure to develop speed and operating technique result in additional and unnecessary toll circuit usage.

Some of the principal operating faults which are reflected in the operating use of toll lines are:

(1) Faulty ringing — especially rings of too short duration.

(2) Failure to pass orders promptly and distinctly.

(3) Failure to remain on the toll line until the called office answers.

(4) Failure to have cleared circuit on a previous call.

(5) Slow answers to line and recall signals at terminating office.

The operating use of toll lines will vary for different percentages of station-to-station traffic and with other factors affecting the operator's use of toll lines. Failure to follow the operating practice, to advance smoothly from one step to another, and to take advantage of opportunities to overlap are reflected in the operating use of toll lines.

Some of the more important operating faults are:

(1) Slow answers to toll line and supervisory signals. (2) Slow release of circuits. (3) Failure to take action required promptly. (4) Failure to clear built-up circuits. (5) Slow answers to TX signals and delay in taking action after signal is answered. (6) Circuit held or released improperly, and circuit released—no call advanced.

Unsatisfactory handling of Inward and Through calls also has a marked effect on the operating use of toll lines due to irregularities such as:

(1) Failure to ring the called office or the called number promptly when such an order is received. (2) Releasing the toll line without attempting to complete or comply with the order received. (3) Ringing on the called line after the station has answered. (4) Reringing the called station improperly. (5) Disconnecting lines to special operators before an answer is obtained or while the distant office is waiting for information to be given. (6) Improper challenging. (7) Irregularity in routing. (8) Failure to clear on through calls. (9) Failure to adhere to the multi-switch operating practices.

Long distance operators in all exchanges should develop efficiency in the operating use of toll lines. This will result in better service to customers and will avoid unnecessary expenditure on the part of the telephone company.

Questions from Illinois Operators

1. When a party thinks he has had a toll call from, say, Chicago during his absence of a day and he asks the operator to find out if there has been a call, what phrase do you use after you reach your TX?
2. When you have a station-to-station collect call and report is received "No one to accept charge," is it a chargeable report and does the call still remain a station-to-station call?
3. On a collect call, station-to-station and charge refused and "AG paid," would it take a person-to-person or station-to-station rate if the rate would be three minutes, 35 cents, on a station call if not collect?
4. What phrase is used when a wrong number is called?
5. In a town with 400 stations how many toll circuits should be allowed to its toll center?

The answers to these traffic questions are presented on page 29.

▼ ▼

Discuss Problems at Second Ohio Fall Meeting

The second of the fall district meetings of the Ohio Independent Telephone Association held at Chillicothe on October 30 was attended by approximately 100 telephone men of central and southern Ohio. It was a very enthusiastic gathering.

The meeting held at the Warner hotel followed an inspection of the new building and equipment of the Chillicothe Telephone Co. of which David McKell is president and Harry Elliott is general manager. The officers of the company were hosts to the visiting telephone men who were also given an enthusiastic welcome by Congressman Harold Claypoll.

Semi-annual reports on the activities of the association were given by President J. W. Safford of Troy, and Frank L. McKinney, Columbus, secretary-treasurer.

Discussions of various subjects of vital interest to telephone men were led by Col. Gustav Hirsch, Columbus, J. T. Carliss of Marion, both past presidents, and others.

The third and last of the series of fall meetings of the association was held at Marion on November 4 on which occasion J. T. Carliss, vice-president and general manager of the local company, was the host of the occasion.

▼ ▼

Telephone Company Pays Its Taxes Early

Following the policy of paying its city taxes on the first day on which taxes can be paid, the San Marcos (Texas) Telephone Co. mailed a check to the city clerk on October 1 and became the first taxpayer to pay up for the current year.

Merton Swift, manager of the company, stated that this has been the practice of his company for a number of years.

XUM

Plant Men

Talk Things Over

'Way Back When—The Office Closed at Nine

BY DOC, THE TROUBLE-SHOOTER

The first telephone exchange installed years ago in our little village was quite a curiosity. It was located in the rear of a harness shop and was run by two brothers called "Dutch" and "Mike." They took care of their shop and the switchboard, and also cooked their own meals. Many a time I have seen one of them leave his work at the bench to answer a call on the switchboard. They always answered calls promptly but were not always so prompt on disconnects.

The switchboard was a small magneto affair in a cabinet mounted on the wall. The operators either stood or sat on a high stool. "Dutch" always seemed to have a lot of fun operating the switchboard and kidding the subscribers as he connected their calls. Mike was a small, club-footed chap of a more serious nature, although he was always kind and considerate over the telephone.

I remember how the lines came from every angle into the little office. All lines were grounded and small porcelain knobs were used for insulators. The crossarms were one-inch by four-inch boards nailed on two by four timbers used as poles. When the office was started only two rural lines were connected but within about two weeks three more were placed in service. The rural lines finally reached the grand total of ten and I imagine each line had an average of about 25 subscribers. They sure did talk in those days and to find a line idle when you wanted to use it, was no less than a miracle.

When the exchange was started we had no telephones other than those on the rural lines. Within a very short time, though, one of the general stores had a telephone installed, and the other soon did likewise. Then the local doctor who also ran the drug store, considered it wise to follow suit.

Soon after that the livery stable and bank joined up. They were followed by the lumber yard and hardware store. It was some time, however, before telephones were installed in residences. Business men did, after a time, realize that they should have a telephone in their residences but others considered them a luxury not within their means.

The telephone central office always closed at nine o'clock each evening and no one was supposed to call after that time except in an emergency. This rule was not difficult to enforce, for in those days almost everyone was in bed by nine o'clock anyway.

A call after nine generally meant a blessed event or something of equal importance; so curiosity got the upper-hand and, no matter how cold the night, everyone listened-in. We also had a general ring used to summon everyone on the line in case of special news such as a storm warning. Even at that early date full advantage of the telephone system was obtained in our little community.

Most of the rings were long and it seemed that some station on those old overloaded lines was being rung continually. We were lucky though as we had the first station installed on our line, and we had one long and one short ring. I often thought how "Dutch" and "Mike" must have tired sitting there on that high stool, grinding out those long rings on the five-bar hand generator. They didn't seem to mind though and perhaps it was a means for them to relax after working on the bench, sewing harness or an old-time stock saddle.

▼ ▼

Blackbird Is Cause of Unusual Line Trouble

From Otto Darr, local manager of the Central Electric & Telephone Co., at Latimer, Iowa, comes a description of a most unusual case of line trouble. A rural metallic line of the company was found to be short-circuited. Thinking the short was caused by dynamiters working on a road-building project in the vicinity, Mr. Darr drove out to investigate. He found that the dynamiters had indeed caused the short—indirectly.

"I found a blackbird with his neck in between the two line wires, which

A blackbird, trapped between two telephone wires at a line transposition when a nearby dynamite explosion caused the wires to flap, was the means of an easy location of line trouble.

were wrapped several times," says Mr. Darr. "It was at a transposition in the line, close to a stump which the dynamiters had blasted. I suppose the explosion flapped the wires and trapped the bird. I borrowed a camera from a farmer's wife, stood on my stepladder and took the enclosed snapshot."

While this was an easy trouble to locate and clear, it was an entirely new one to Mr. Darr, who showed his resourcefulness in getting a record of it. The illustration shows the result of his efforts with the borrowed camera.

XUM

Professional Shopper

tells why she shops through the Classified Telephone Directory

Emilie Pleydell, member of The Associated Purchasing Agents of New York, who shops for clients from all over the Western Hemisphere, says:

"Whenever I have an order for a hard-to-find product, I just turn to the 'yellow pages' to find who sells it. They're packed with buying information that helps me get my clients exactly what they want, when they want it."

Let this handy buying guide make shopping easy for you, too. Just thumb through the 'yellow pages' and see for yourself the wide range of products, services, trades, business and professions listed there. Then, next time you need buying help for occasional or everyday wants . . .

LOOK IT UP IN THE CLASSIFIED SECTION.

It makes good business to bring the "buyer" and the "seller" together

Here are two examples of the current national advertising campaign for Classified Telephone Directories. One is designed to help consumers in buying . . . one is intended to help merchants in selling. Thus both are instrumental in making telephone service more complete and useful. Both are working toward greater appreciation and increased usage of the telephone throughout the country.

AN ADVERTISEMENT OF THE BELL TELEPHONE SYSTEM

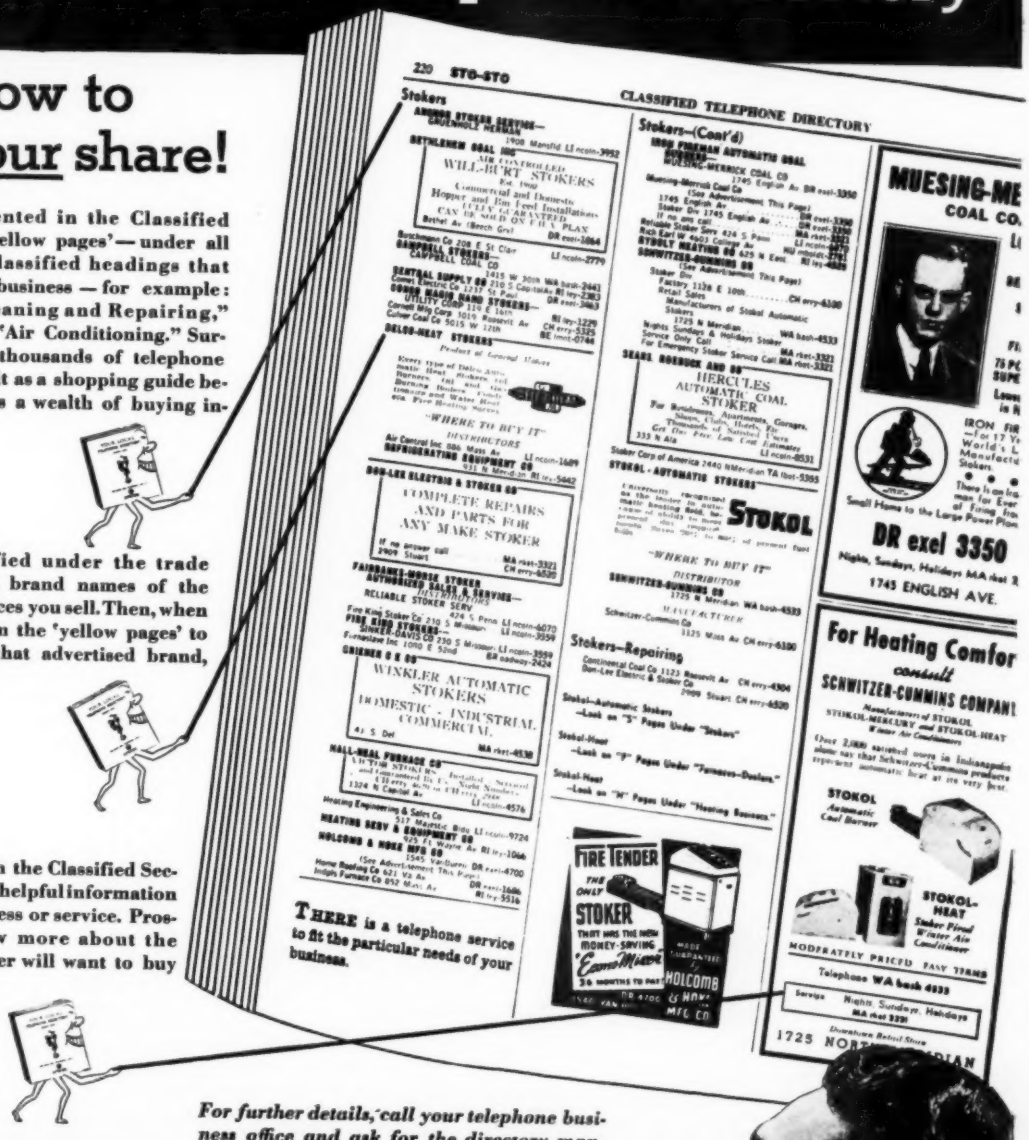
More business opportunities right in your Telephone Directory

How to get your share!

1 Be represented in the Classified Section—'yellow pages'—under all the different classified headings that apply to your business—for example: "Furnaces—Cleaning and Repairing," "Oil Burners," "Air Conditioning." Surveys show that thousands of telephone subscribers use it as a shopping guide because it contains a wealth of buying information.

2 Be identified under the trade marks and brand names of the products or services you sell. Then, when prospects look in the 'yellow pages' to find who sells that advertised brand, they'll find *you*.

3 Advertise in the Classified Section, giving helpful information about your business or service. Prospects who know more about the service you render will want to buy from you.



THERE is a telephone service to fit the particular needs of your business.

For further details, call your telephone business office and ask for the directory man.

Prospects depend on the Classified Section to find "WHERE TO BUY IT"

Here and There in the Field

Dr. Bell, Inventor of Telephone, Honored by Stamp Issue

In the presence of several members of the family of the late Dr. Alexander Graham Bell, Postmaster Peter F. Tague of Boston, Mass., on October 28 presented the first sheet of 10-cent stamps, honoring the great inventor, to Alexander Graham Bell Grosvenor of Washington, D. C., 12-year-old great-grandson of the famous scientist. The exercises were conducted under the auspices of the Bell Stamp Club of New England, an organization within the New England Telephone & Telegraph Co.'s family of employes, under the leadership of President Erle S. Bacon.

Group at Bell stamp issue presentation recently in Boston, Mass. Left to right, MELVILLE BELL GROSVENOR, grandson, and MRS. GILBERT GROSVENOR, daughter of Dr. Alexander Graham Bell; ERLE S. BACON; MISS GLORIA GROSVENOR, granddaughter of Dr. Bell; B. CLINTON TAYLOR, Stamp Club treasurer; ALEXANDER GRAHAM BELL GROSVENOR, great-grandson of the inventor; JAMES W. KIDDER, vice-president of Stamp Club, and POSTMASTER PETER F. TAGUE.

The new stamps were first placed on sale at Boston on that date, and the presentation was made at Boston because of Dr. Bell's triumph in that city in 1876, practically within sight of the present post office location.

A second sheet was allocated to Alexander Graham Bell Fairchild, another great-grandson of Dr. Bell. A third sheet was to be sold to the National Geographical Society for display in its headquarters. Dr. Bell was president of that organization from 1898 through 1903. A fourth sheet was sold to Boston University, where Dr. Bell taught in his earlier career, and will be preserved for appropriate showing in that institution. President Daniel Marsh attended the exercises in this connection.

Pacific T. &. T. President Heads Pioneers of America

At its annual general assembly which closed a three-day session recently in New Orleans, N. R. Powley, president of The Pacific Telephone & Telegraph Co., was elected president of The Telephone Pioneers of America. This organization, national in scope, is composed of men and women of 21 years or more in the telephone industry. It was formed in 1911 and now has in excess of 45,000 members.

President N. R. Powley made his

WE INVITE COMPARISONS

By what ever standard you measure values in drop wire you will find that GENUINE IRONITE exceeds your demands, whether it be economy, efficiency or dependability—

GENUINE IRONITE starts its saving in the first cost—priced at 20% to 30% less than copper or bronze.

GENUINE IRONITE saves in installation costs — works from 10% to 15% faster due to special formula soft iron conductors.

GENUINE IRONITE saves in trouble calls—an unmeasured amount. Its hard armored braid and 30% specification rubber insulation stand up longer and better.

Start your savings N-O-W by ordering a coil of GENUINE IRONITE from your supply house today.

Paragon Electric Co. 39 W. Van Buren St. CHICAGO

N. R. POWLEY, San Francisco, Calif., president of The Pacific Telephone & Telegraph Co., has been elected president of The Telephone Pioneers of America.

acceptance speech by long distance telephone to the delegates gathered in convention at New Orleans.

▼ ▼

Rate Refunds Subject to Deductions for State

The Oklahoma Supreme Court on October 22 upheld the constitutionality of statute of 1915 which authorizes the state corporation commission to deduct 10 per cent of refunds in utility rate cases and turn the money into the state treasury. The opinion was handed down in the case of Sadie E. Crawford et al v. the Oklahoma Corporation Commission, and upheld the ruling of the commission, which contended it had the right to retain the funds.

The appeal arose from the action of the commission in retaining $34,000 for the state out of refunds of $226,499 collected from the Southwestern Bell Telephone Co. for its subscribers at Tulsa, Okla., and $118,829 for subscribers of the same company at Oklahoma City, after rate reductions had been sustained by higher courts. The amounts represented refunds made by the telephone company for rates charged in excess of finally approved charges while the cases were pending on appeal to higher courts from the commission's orders.

The court decision held in part: "In proceedings involving rates charged by utility companies, the law as enacted by the legislature requires the parties benefited, where appeals are prosecuted and rates are suspended pending appeal, to bear a part of the expenses paid by the state."

Pacific Bell Rates Cut

Million Dollars in Washington

REDUCTIONS in local exchange rates of the Pacific Telephone & Telegraph Co. in the state of Washington amounting to more than one million dollars annually were ordered October 31 by the Washington Department of Public Service, thus concluding a year-and-a-half investigation of the company's rates and practices.

The company is directed specifically to file within 45 days rate schedules for the entire state which will effect a net decrease to subscribers of $1,053,533. It is also to file increases in intrastate long distance tolls amounting to $272,563, on the theory that existing intrastate rates do not give sufficient return to the company.

Chairman Don G. Abel of the commission, estimated this would lower telephone costs an average of 9 per cent on the basis of an average monthly bill per telephone of $3.59. However, Seattle and six other cities charge an occupational tax which the rate order directed the company to pass on exclusively to residents of the cities involved. The Seattle tax is 4 per cent on gross income.

The company paid $291,121 in occupational taxes to Seattle, Spokane, Bellingham, Olympia, Port Townsend, Shelton and Dayton in 1939. This, including $237,416 which went to Seattle, was paid by all telephone users in the state.

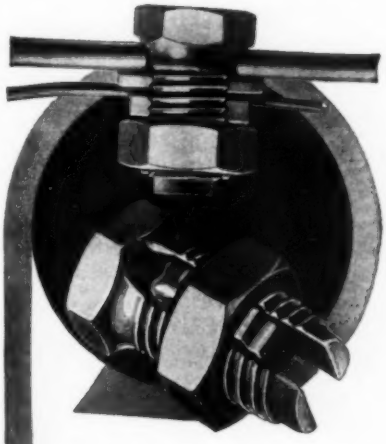
The company's income is restricted to 5 per cent on a book value of $42,500,000 instead of 7¼ per cent on the 61 million dollars claimed by the company. Any excess is to be placed in a reserve fund.

The lowered rates should, the department of public service said, "provide a low cost residential stand-by service on lines having four or more parties. This service will be designed for the purpose of enabling most of the homes in the state, not now served, to have incoming and emergency telephone service."

The order refused a company request to extend existing metered service in Seattle, Tacoma and Spokane, but granted permission for maintenance of existing optional metered service.

Chairman Abel disagreed with his fellow board members, Arthur Garrison and Ralph Benjamin, who included in the order a provision which

"RELIABLE"
BRIDGING
CONNECTORS



- Positive, trouble-free connections
- Substantial saving in installation time
- Corrosion-resisting
- Not subject to "Season Cracking"
- Equally efficient on repeated re-use

A most *reliable* means of making solderless tap connections for telephone, telegraph and signal lines. These connectors have a large margin of strength over actual field requirements and cannot be distorted with a standard telephone socket wrench. You are assured a superior connection with considerable saving in time and lower costs. Request a test sample.

"RELIABLE"
IDENTIFIES THE QUALITY

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

XUM

threatens to kill the company pension plan for its 4,200 employes in the state.

The order prevents the company from continuing to charge $250,000 to "operating expense" for the pensions. It provides that hereafter the costs of the pension plan must be paid out of profits. Mr. Abel suggested that interest from the company's two million-dollar pension reserve fund be used instead.

In a statement accompanying the order Mr. Abel said:

"The company should be authorized to continue making pension payments. If a revised pension plan were adopted by the company to meet objections, I believe the department would approve it. The principal objection to the present plan is that the employes have no vested right in the pension fund."

The Pacific company will oppose the rate cut "with every means at our command," I. F. Dix, vice-president and general manager of the company for Washington and Idaho said November 1.

Referring to the order issued October 31 and also to an order of the department in July denying the company's request for a more than $2,000,000 state-wide rate increase, Mr. Dix said: "This business cannot survive under the kind of regulation represented by these recent orders of the department."

The department's order of last July 7 denied three applications by the company for rate increases. The company, contending it was not making a sufficient return to meet operating expenses, asked that $1,398,863.52 in rate increases be passed on to the users of the company's 280,000 telephones in the state. This was denied.

The company, since then, has taken an appeal of the July 7 order to the Thurston County Superior Court, where it is still pending.

In the July 7 order, the department did not rule on its own investigation of telephone rates and, terming it a "challenge to all telephone rates," promised a subsequent ruling. The order issued October 31 is that ruling.

Commission and Court Activities

Tolls Between New York and New Jersey Points

Revised rate schedules covering interstate message toll service in the New York-New Jersey area were filed with the FCC October 30 by the New York Telephone Co. and the New Jersey Bell Telephone Co. The new tariffs reduce the charges for interstate toll messages between points located in New York, in and around New York City, and points in certain counties in New Jersey.

The differences in the level of rates for interstate message toll telephone service applicable to points 40 miles or less apart in this area have been the subject of correspondence and discussion by the commission with the companies for some time. It is estimated that the new rates will effect a reduction of $850,000 annually in the toll revenues.

Electric Cooperative Held Not Liable for Interference

Progress cannot be stayed at the call of decadence, the Arkansas Supreme Court declared October 28 in ruling that a modern rural electric cooperative is not liable for damages when its power facilities interfere with an outmoded telephone system. The opinion, written by Chief Justice Griffin Smith, reversed a Washington Circuit Court judgment awarding $100 damages against the Ozarks Rural Electric Co-operative Corp. to Sam Oliphant and Joe Gilliand, operators of a nine-mile rural telephone system.

The telephone line is of the so-called "grounded" type of construction, wherein one wire is used. The owners charged that the cooperative's 7,200-volt power lines interfered with the parallel telephone system, causing a buzzing sound which made telephone conversation difficult.

"The undisputed facts are that the telephone system is outmoded and that if it were modernized, interference would not occur," the court's opinion said.

Warning the telephone line owners they should use "scientific construction" or take the consequences, the court pointed out that both the telephone and electric companies have a right to use of the highway, and that each is within the law insofar as physical construction is concerned.

"No actual negligence having been

Crapo GALVANIZED PRODUCTS

FIRST FOR GUYS AND MESSENGER

SUPERIOR tensile strength, rugged dependability, long, economical life make Crapo Galvanized Steel Strand first choice for important construction work. Low first cost, low yearly cost, represent definite savings wherever this time-proved product is in use. Crapo Galvanized Steel Strand is available in all standard grades and sizes from representative jobbers. Or, write—

INDIANA STEEL & WIRE CO.
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Formerly FRENCH BATTERY CO.
MADISON - WISCONSIN

shown in the case at bar," opinion states, "it follows that if recovery lies it must be predicated upon appellee's (the telephone company's) assumed right to operate an antiquated telephone system without being subject to the necessary inconvenience caused by phenomena attending operation of a modernly constructed electric system.

"No such superior right exists. Public convenience and necessity take precedence. It is obligatory upon owners of telephone lines, situated as appellee's are, to make use of reasonably available scientific construction before invoking the aid of courts for relief from the normal incidents of rural electrification."

The chief justice delved into Deiser's Law of Conflicting Uses of Electricity and Electrolysis to prove his point and made this quotation:

"Any telephone apparatus capable of being disturbed to any marked extent by induction must be classified as defective, so long as there exist insulating or isolating devices, such as the complete metallic circuit, or the non-inductive circuit, that would protect the telephone or telegraph lines."

J. E. Flanders, engineer of the state utilities commission, said metallizing of the telephone lines at a cost of $35 to $50 a mile would correct the humming and buzzing sound.

▼ ▼

Michigan Bell's New Rural Line Plan

The Michigan Public Service Commission has issued an order approving a new rural telephone construction plan recommended by farm leaders and described by the Michigan Bell Telephone Co. as the most liberal in the history of communications in the state.

The plan will permit applicants for rural service to pay for line extensions, beyond an initial non-chargeable allowance, in monthly installments over a five-year period. Always in the past, these charges had to be paid in a lump sum in advance of construction.

Friends of the plan cited other advantages. For one thing the maximum construction charge, beyond the initial allowance, is scaled down from $300 to $270 a mile under the new plan. No charge will be made for wire connecting the main line to the house up to 500 feet from the highway with a charge of five cents a foot beyond that distance.

New construction will be located on private right-of-way supplied by the applicants, a provision which will tend to eliminate the hazard of tree interference that is sometimes met along lines that follow the highway.

Under the plan, no construction charge will be made if the number of applicants averages one per 3/10ths mile of rural line extension. If the number does not reach that average, the cost will be met by a charge of 45 cents a month per 1/10th mile in excess of this initial allowance, and will be prorated among applicants served by the extension. Payments will extend over a five-year period.

The plan also provides that the monthly installments will be reduced as additional applicants are served along a particular line extension.

Company officials will place the plan into effect as early as possible. An informational program will be conducted among rural residents to acquaint them with its provisions.

▼ ▼

FCC Authorizes FM Broadcasting for 15 Stations

The final "go" signal for FM (frequency modulation) was given by the Federal Communications Commission October 31 in authorizing 15 applicants geographically scattered throughout the nation to engage in this new type of broadcast on a commercial basis as soon as they are able to do so.

"The granting of these licenses by the commission," commented Chairman James Lawrence Fly, "marks an important milestone in the continued advance of the radio industry."

The remainder of the more than 50 applications for FM commercial operation on the high frequencies will be acted upon at the earliest opportunity.

These authorizations embrace proposed FM service to millions of persons in widely-scattered sections of the country, and are expected to expedite the rapid development of this new program art. Giving these stations the starting gun is the last formality in a series of actions by the commission to make possible, for the first time in radio history, the use of the high frequencies for commercial broadcast.

▼ ▼

Policemen Lauded As Telephone Operators

Justice Charles B. McLaughlin of the New York Supreme Court, first district, paid a tribute to policemen as telephone operators during arguments before him in a suit to restrain the police department of New York City from employing eligible patrolmen as telephone operators in the department. The suit was brought on behalf of a number of civilians on the civil service eligible list for operators.

"Policemen are the finest telephone

SANDS

TYPE 60
CABLE TERMINAL

For a permanent, workmanlike job on your next cable installation, try SANDS Type 60 terminals. Bring the cable in from top or bottom—and see how snug, how smooth, all those connections are. You'll know you've done a craftsmanlike job.

It takes good products to do a good job—and SANDS cable terminals are really good.

TYPE 60 SPECIFICATIONS

With or without 6 ft. 22 gauge cable stub. Zinc cover. Reversible. Galvanized cast iron frame and core box. Capacities: 11, 16, or 26 pair.

AUTOMATIC ELECTRIC

TELEPHONE, SIGNALING, AND COMMUNICATION APPARATUS

Distributors in U. S. and Possessions:
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1033 West Van Buren Street, Chicago, U.S.A.

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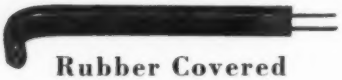
EVERSTICK ANCHORS...

Speed and ease of installation are features that crews and engineers appreciate in Everstick Anchors. Nut housing locks, anchor firmly on rod — entire unit is installed and expanded in a minimum of time.

Write for new bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

TWINPLY
PROTECTED



Rubber Covered
Under the Ground
Telephone Wire

Many problems — relating to both construction and maintenance—are solved by putting the wires under the ground when you know the insulation will take it.

"Twinply Protected," the new underground wire developed for Suttle, has what it takes. That is, *TWO* kinds of rubber—one for abrasion protection, and one for chemical protection.

The inside gray-colored rubber is a soft composition that is highly resistant to any acids or alkalis that may be present in the soil. They won't get through this protection to the wire.

The outside black coating is tough like tire rubber and permits rough handling of the wire and protects the wire from soil pressure and other forms of abrasion. It isn't so good against chemical conditions.

Makes Buried Lines a Really Safe Practice

See Suttle Catalog or write for sample and prices.

SUTTLE EQUIPMENT CO.
LAWRENCEVILLE, ILLINOIS

operators in the city, and I know from ten years' experience as district attorney in the Bronx," Justice McLaughlin said, interrupting an argument of the attorney for the plaintiffs. "If ever you were district attorney, you might wish that all telephone operators in the city were patrolmen."

Justice McLaughlin recalled a murder case in Brooklyn "many years ago," which Police Commissioner Valentine, then a telephone operator, took an important part in solving. He reserved decision on the suit.

▼ ▼

Summary of Commission Hearings and Rulings

Federal Communications Commission

October 15: Amended authorization, granted January 31, 1940, for supplementing existing facilities between Washington, D. C., and Baltimore, Md., by the American Telephone & Telegraph Co., the Chesapeake & Potomac Telephone Co., and the Chesapeake & Potomac Telephone Co. of Baltimore City.

Amended order approves plan of construction whereby two separate cables will be installed for part of the route, instead of a single cable containing two groups of conductors separated by a metal shield, as originally authorized.

October 31: Authorized Pacific Telephone & Telegraph Co. to supplement existing facilities between Redding and Weed, Calif. (73 miles), at estimated cost of $1,344,100, of which $461,500 will be spent for carrier and associated equipment. Same company also authorized to supplement existing connections between Sacramento and Stockton, Calif. (47 miles), at a cost of about $672,600.

October 31: American Telephone & Telegraph Co. and Illinois Bell Telephone Co. granted authority to improve existing facilities between Wyanet and Springfield, Ill. (114 miles), at an estimated cost of $943,000, of which $685,000 would be borne by the A. T. & T.

Illinois Commerce Commission

October 30: Elimination by the Illinois Bell Telephone Co. of present 10-cent toll charge between Berwyn and Chicago asked in petition filed by Joseph Serhant, city attorney for Berwyn. Taken under advisement by commission which continued it to November 27.

October 30: Order issued suspending until March 8, 1941, proposed higher rates of the Farmers Fountain Telephone Co. for service in Columbia, Waterloo, New Hanover, Valmeyer, Dupo and Harrison in southwestern Illinois. The suspension was ordered to permit the commission to investigate the reasonableness of the proposed increases.

November 7: Hearing at Springfield on the complaint of Fred Rascher, alleging unsatisfactory service by the Iroquois Telephone Co. at Cissna Park.

November 7: Hearing at Springfield on application of the Illinois Commercial Telephone Co. for permission to increase rates for service at Bement, Carlock, DeLand, Lawrenceville, Monticello, Piper City and Roanoke.

November 7: Hearing at Springfield on petition of H. E. Skinner, Ella Roach, A. N. Craig and others for an order requiring the Illinois Commercial Telephone Co. to restore service, temporarily discontinued March 28, 1940, on certain lines south from Carterville.

November 7: Hearing at Springfield on the citation by the commission of the Illinois Commercial Telephone Co., to show cause why there should not be a reduction in rates for service furnished by the company.

November 8: Hearing at Chicago in the matter of proposed advances in rates for telephone service by the Western Illinois Telephone Co. at Aledo, Little York, New Boston and Seaton.

November 8: Hearing at Springfield in matter of proposed advances in rates for service at all exchanges of the Montrose Mutual Telephone Co. stated in rate schedule Ill. C. C. No. 2 of the company.

November 8: Hearing on the application by the Southeast Missouri Telephone Co. for authority to file changes in rates for its exchanges at Olive Branch, Tamms, and Thebes on less than 30 days' notice.

November 8: Hearing at Springfield on application of Illinois Bell Telephone Co. for authority to lease certain floor space in its office building at Springfield to the American Telephone & Telegraph Co.

Indiana Public Service Commission

November 1: Carroll Telephone Co. authorized to issue new first mortgage 4½ per cent bonds totaling $30,000. Proceeds are to be used for rehabilitation of the company's Delphi exchange and the recently-acquired Idaville property.

Michigan Public Service Commission

November 8: Hearing at Lansing on the application of the Michigan Bell Telephone Co. for authority to establish an exchange at Hermansville.

Minnesota Railroad & Warehouse Commission

October 30: Authorized Arco Electric Co. to place in effect at its Arco exchange new and higher telephone rates, beginning November 15.

Missouri Public Service Commission

October 28: Joint application filed by United Telephone Co. and Anson R. Tippey, for permission to sell and purchase, respectively, the telephone exchange at Papinsville.

Ohio Public Utilities Commission

October 28: Authorized the Ohio Bell Telephone Co. to file revised schedules for its Canton and North Canton exchanges. The principal revisions are the extension of the base rate area boundaries to meet the demand for base rate area service and the elimination of undeveloped territory.

October 29: Authorized the United Telephone Co. to establish for its Belle Center exchange with free service to Bellefontaine, the county seat, and the neighboring exchange of Rushylvania, rates as follows:

Business independent line, increased from $3.50 to $4.75; business 5-party, $2.75 to $3.25; business rural, $2.75 to $3.75. Residence independent line,

$2.50 to $3.00; residence 5-party, $2.00 to $2.25; residence rural, $2.00 to $2.25.

The rates became effective November 1 when new service was inaugurated.

October 29: Authorized the new St. Paris Telephone Co. to purchase for $68,500 (or such greater or lesser sum as the commission might find to be the value) all property, including $2,000 cash working capital, of the Farmers & Merchants Telephone Co. of St. Paris. New company asked permission to finance purchase by issuing and selling at $50 per share, 990 shares of no par common stock, and at par, $19,000 in five-year 4½ per cent first mortgage notes.

It was ordered, however, that the transaction date as of September 30, 1940, on the basis of financing the consideration by issuing and selling 774 shares of no par common stock at $50 per share and the $19,000 of notes at par. Value of property, including $1,200 cash, found to be $57,714. Order further authorized new company to use the escrowed proceeds, $500, of the ten qualifying shares issued under authority of an earlier order in the payment of its organization expenses.

October 31: Authority granted to Ohio Associated Telephone Co. of Marion to issue and sell at not less than 106, $1,770,000 new first mortgage 30-year bonds bearing interest at not to exceed 3½ per cent, the proceeds to be used to redeem at 107½ the company's outstanding first mortgage 4½ per cent bonds due in 1966.

Oklahoma Corporation Commission

October 16: Petition filed by W. S. Mason and others, requesting investigation by the commission of service on a rural line of the Southwestern Bell Telephone Co. near Cordell. Complainants allege that new subscribers added recently have overloaded the line.

October 31: Granted application of Doy Worley, owner of Strong City Telephone Co., for permission to discontinue service at Strong City and surrounding rural territory, because of continued financial losses.

November 5: Hearing on application of Will Rogers for telephone service to his residence, five miles west of Sapulpa, by the Southwestern Bell Telephone Co. The Southwestern Bell company has refused to give him service, and the Kelleyville Telephone Co. has protested that such service would be an invasion of its territory.

Pennsylvania Public Utility Commission

October 21: Approval given sale of the property of the Valley Telephone Co. of Emlenton to The People's Telephone Corp. of Butler for $39,000. The Valley property will be rehabilitated and improved toll and local service provided.

October 21: Sale by The People's Telephone Corp. of Butler of $700,000 first mortgage 3¼ per cent bonds to the Provident Mutual Life Insurance Co. of Philadelphia, approved.

Wisconsin Public Service Commission

November 4: Hearing at Madison on petition of the Mondovi Telephone Co. for authority to increase its rates for telephone service.

November 4: Hearing at Madison on application of Mondovi Telephone Co. for authority to install a common battery switchboard and station apparatus at its Mondovi exchange.

November 7: Hearing at Madison on application of Pine River Telephone Co. to increase rates.

November 12: Hearing on application of Commonwealth Telephone Co. to install dial equipment at its Ridgeway exchange. Company also asks permission to increase its rates upon inauguration of the new service.

Answers to Traffic Questions on Page 20

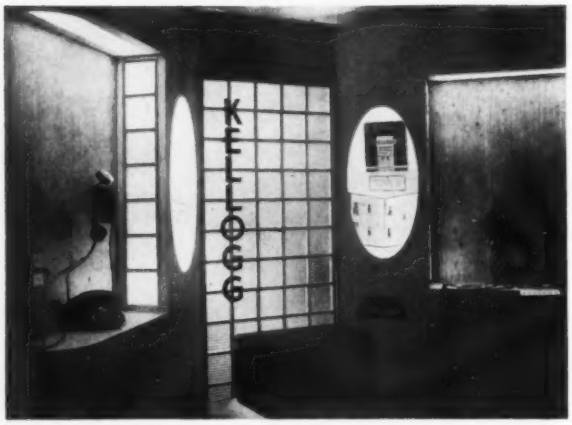
1. Pass a WH party report in the regular way. If the OTC operator fails to locate a ticket bearing a call for the party who is reporting ready to talk she will refer the case to her supervisor. By questioning the party reporting WH ready she will determine if a call was placed for him from her office.
2. If no one is there who can accept the charge the call is considered equivalent to one on which the called station refuses to accept the charge. The report is entered on the ticket, underlined, and the operator asks the calling party if he will pay for the call. If he does not wish to pay for the call and cancels it, the call is subject to a report charge.

   The calling party may have word left at the called station for someone who will accept the charge and in this case the call is subject to the person-to-person rate. If the calling party wishes to have the call tried again as a station-to-station call, the first call is cancelled and is subject to a report charge and a new ticket is recorded.
3. The station-to-station rate will apply on the call provided the calling party agrees to pay for the call on the first use of the toll circuit.
4. Say, for example, "I am sorry, you were called by mistake."
5. The number of toll circuits required depends upon the volume and class of traffic offered. Therefore, answer to your question would have to be obtained by making a Toll Traffic Study.

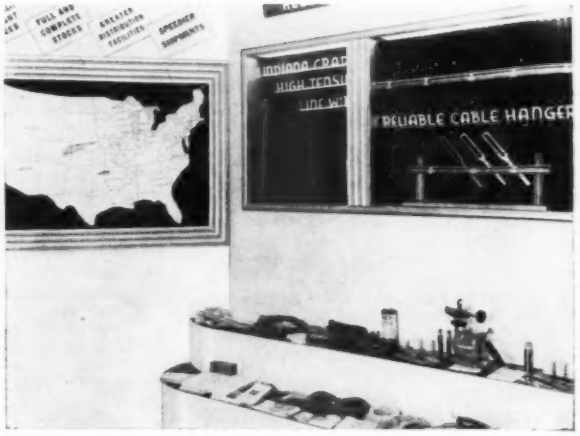
HERE'S A TYPICAL EXAMPLE
On your lines this L-M Steel House Bracket will give you a typical example of the long service life you can expect of all L-M Telephone Construction specialties. Its fine, high-strength steel body is thoroughly galvanized. Its glazed porcelain insulators meet the industry's most exacting standards. Make a note now to try this L-M House Bracket... and to get the full facts on the complete line of L-M Pole Line Hardware and L-M Telephone Construction Specialties
LINE MATERIAL CO.

XUM

Kellogg Exhibit at National Convention



Kellogg's attractive display of equipment can be seen in this view of a corner in one of the exhibit rooms. Shown are dial Masterphones, key boxes, and a Kellogg cordless PBX switchboard.



A section of the Kellogg line supply exhibit. A giant map of the USA had a myriad of blinking red lights which represented the various distribution points in Kellogg's system of warehouses.

The Peatrophone

The latest and most important invention for securing additional revenue for telephone companies.

For the Subscriber—The Peatrophone will operate on any telephone, answer when called party is absent and deliver a message to the calling party. It will then receive and record any incoming message which can later be "played back" by the subscriber upon his return. Serves as a mechanical secretary at moderate cost.

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Peatrophone Corporation
342 Madison Avenue
New York, N. Y.

A SPARKLINGLY - attractive exhibit was that of the Kellogg Switchboard & Supply Co. at the recent national convention in Chicago. In the opinion of almost everyone, it was the company's finest and most attractive exhibit at a national convention. All the rooms were inter-connected to make one vast and continuous exhibit, opening upon the spacious elevator corridor where the convention registration desks were set up.

The exhibition rooms disclosed hundreds of different pieces of equipment, attractively set up to blend into a complete picture of what the telephone man needs for his profitable, efficient operation. White walls with modernly-designed ledges and columns and shadow boxes formed a rich background for the various types of equipment. Window openings with gold-colored frames and structural glass brick with colored lights behind them, created a vivid, colorful effect and gave a feeling of richness and good taste to the entire exhibit.

In the shadow boxes were mounted various types of instruments, which were highlighted by indirect lighting. Knotty pine panels were spaced at appropriate intervals and served as an attractive setting for the bakelite Masterphones, key boxes, desk set boxes and various magneto telephones, bell boxes and miscellaneous equipment.

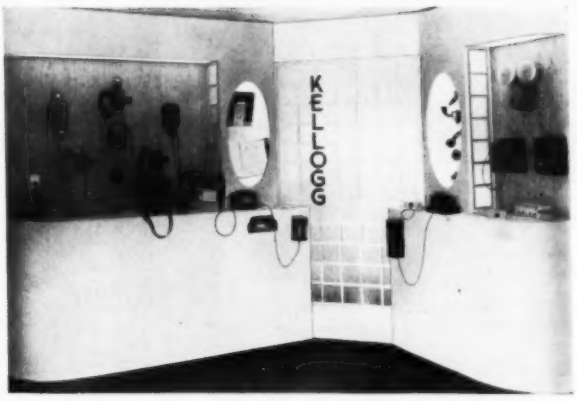
A progressive journey through all these exhibits would begin at one of the end rooms which housed a Masterbilt Junior and a type "K" PBX switchboard. These switchboards were surrounded with glass brick panels with vari-colored lights playing through the glass. The switchboards were in full operation and were connected to telephones located for the convenient use of visitors. Interior inspection of the Masterbuilt Junior showed the roomy and accessible arrangement of the equipment.

The center of the adjoining room was occupied by a four-bay, 100-line ultimate capacity Relaymatic switchboard. Lumiline lights focused attention on this mechanism. Telephones were spotted at convenient positions so that one could dial a number and watch the speedy, orderly completion of his call by the Relaymatic.

A Kellogg cordless PBX, displayed here also, held much interest for the visitors. Indirect lighting, spacious display space and artistic arrangement of numerous telephone instruments furnished a beautiful setting for all the equipment.

The lounge room was the half-way point in a tour of Kellogg exhibit. Comfortable chairs and sofas, writing desk, etc., made this an inviting place to stop to rest and visit. It was also a favorite place to renew old acquaintances. A large animated display

Various Kellogg products were handsomely arranged in shadow boxes recessed in walls and columns located between beautifully-lighted glass brick windows. Rubber-covered cords in the versatile side-mounting extension Masterphones are featured in this display.



The pleasing arrangement and modern design of the entire display are readily seen in this view of a section of a Kellogg telephone exhibit room. The company endeavored to have interesting as well as attractive displays in all of its four exhibit rooms.

showed how the Kellogg non-positional transmitter insures perfect transmission, regardless of its position or angle.

In the telephone exhibit room plain walls were transformed into a dazzling array of colored lights, shimmering behind attractively-shaped areas of glass brick trimmed with gold frames as in the other exhibit rooms. Every wall and corner held something worthwhile to see. Mounted around the sides were telephones to fit the need of every telephone man. There were the bakelite Masterphones—for wall or desk, for dial or manual service. One section was devoted to Kellogg magneto telephones. This display showed how the old style magneto sets could be modernized by the addition of a bakelite Masterphone handpiece.

Kellogg products which are playing an important part in the National Defense Program, and are used by the Army, Navy, Aviation, Signal Corps, etc., were shown on a special revolving display fashioned after the familiar Ferris Wheel.

The last of the exhibit rooms contained a great assortment of Kellogg line supplies. Across one corner of the room was a giant map of the United States. A myriad of red blinking lights on it pointed to the strategically-located Kellogg warehouses in the company's coast-to-coast system. Several popular line supply items were illustrated by small scale models to show their applications on the job. Tiered ledges were filled with other items that are in daily use by the operating companies.

Lincoln (Neb.) Company Prepares for Fall Drive

The Lincoln (Neb.) Telephone & Telegraph Co. will inaugurate its fall drive for new business on November 18, according to General Commercial Superintendent H. F. McCulla. M. M. Hale is in active charge of the drive, to be known as the "dog house" campaign.

The dog house theme will be given a big play during the four weeks of the drive. Dog houses will be displayed at area headquarters, an individual one being prepared for each area manager. The dog houses are large enough to fit over the heads of the laggards; a "super deluxe" one will be prepared for the tail end area manager.

A daily bulletin will record the progress of the sales drive. Mr. McCulla stated that since the company had added 159 stations to the net total during September, it expects to secure satisfactory results from the campaign, which will be advertised in every newspaper in company territory.

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XUM

"Telephony's" Engineering Data

By B. C. Burden

Index, General.
November 9, 1940.
No. 53-A, Page 12.

Characteristics of Resistors Used in Electronic Equipment (Concluded)

Combination Resistors: Combinations of rheostats or potentiometers, where two or more controls (generally only two) are mechanically connected to the same shaft with each resistor controlling a specific part

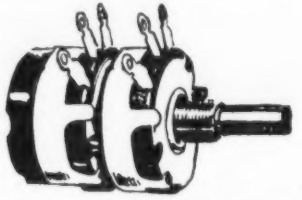

FIG. 16. COMBINATION TYPE VOLUME CONTROL.

of a circuit, are often used. Such controls, as shown in Fig. 16, are found principally in radio sets for volume control purposes. For example, one rheostat might shunt the antenna input circuit, while the other

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The Finest Line of New Oak Telephone Cabinets for rebuilding Wall Phones and Desk Sets ever offered and at the lowest prices.—ANY QUANTITY ONE TO ONE THOUSAND.
Obsolete wall phones or parts rebuilt into modern wall or desk phones with new cabinets.

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Daniel H. McNulty, *Manager*
Rogers Park Station **Chicago**

"Telephony's" Engineering Data

By B. C. Burden

Index, General.
November 9, 1940.
No. 53-A, Page 13.

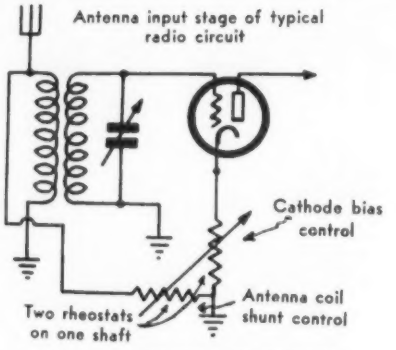
Antenna input stage of typical radio circuit
Cathode bias control
Antenna coil shunt control
Two rheostats on one shaft

FIG. 17. APPLICATION OF COMBINATION TYPE OF CONTROL.

controlled the grid bias to the radio frequency tubes, as shown in Fig. 17. They are also often used in measuring instruments.

Electrad Type Power Resistor

An unusual type of resistor that is quite popular for use in power supply units is shown in Fig. 18. This resistor consists of a high-grade resistance wire which is wound around an asbestos-insulated copper wire. This unit is then wound on a lava tube. Such resistors are available in sizes up to 100 watts.

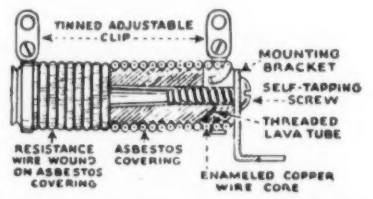

FIG. 18. ELECTRAD TYPE OF POWER RESISTOR.

"Telephony's" Engineering Data

By B. C. Burden

Index, General.
November 9, 1940.
No. 54-A, Page 1.

The Impedance Bridge

The impedance bridge in its basic form is a device capable of measuring inductance, capacity and effective resistance of an alternating current circuit. It is a necessary instrument in any laboratory, but because of the cost and precision with which it must be operated, it has never been used to any extent by any except the larger telephone companies. With the introduction of a new and reasonably-priced instrument, however, its popularity should increase in the telephone field.

The new alternating current bridge is a somewhat modified form from that generally found in university laboratories; however, it is very practical and is capable of measuring inductance, capacity and direct current resistance.

It should be noted that while the impedance bridges used in the large laboratories measure the *effective* resistance of any device to alternating current, this new instrument measures only the *direct current* or *ohmic component* of the effective resistance. This bridge, therefore, does not take into account those components of effective resistance due to hysteresis, eddy current, skin effect and other losses.

General Features

This bridge consists essentially of the variable ratio arm Wheatstone bridge arrangement, and the circuit includes three standards, consisting of inductance, capacity, and resistance. The tone necessary for the bridge operation is obtained from a 1,000-cycle vacuum tube oscillator in conjunction with a two stage amplifier.

The oscillator and amplifier are operated from an alternating current power supply, which permits the bridge to be operated directly from the 110-volt 60-cycle source. A pair of high impedance radio head receivers is used as the usual null indicator on the bridge. The unknown resistance, capacitance, or inductance to be measured is connected to the two posts in the upper left-hand corner of the panel (Fig. 1) and designated as X. A *range selector switch* must be set on the range at which the item under measurement is thought to fall.

IN THE NATION'S CAPITAL

(Concluded from page 14)

P. S. GETTING back to our own field once more, several developments of telephone interest occurred at the FCC last week. You probably have already seen in the press about the new interstate message toll tariff in the New York-New Jersey area filed by the New York Telephone Co. and New Jersey Bell Telephone Co., calculated to result in savings of approximately $850,000 a year to toll users.

Then there was the actual licensing of 15 frequency modulation radio broadcasting stations to go on a commercial basis. There are more than 50 more applications which will come up soon. The new authorizations concern only a few large cities: New York (3 stations), Chicago, Detroit, Los Angeles, and Milwaukee.

New telephone line construction, representing an expenditure of nearly $3,000,000 was authorized by the FCC for the Pacific Telephone & Telegraph Co. The proposal is to supplement existing facilities. . . . The FCC announces that it will confer with the National Television Systems Committee early in January for the purpose of receiving a "progress report" on that committee's study of the television situation. . . . The city of St. Paul, Minn., has asked the FCC (as well as Attorney General Jackson) to assist it in its telephone rate controversy which the city wants to appeal to the U. S. Supreme Court.

▼ ▼

Texas Convention Will Be Held in Fort Worth Next March

Fort Worth, Texas, is the city selected by The Texas Telephone Association in which to hold its 1941 annual meeting. The convention will be held at the Texas Hotel on March 19, 20 and 21. George B. Butler, Austin, is secretary, and Oscar Burton, Tyler, president.

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MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

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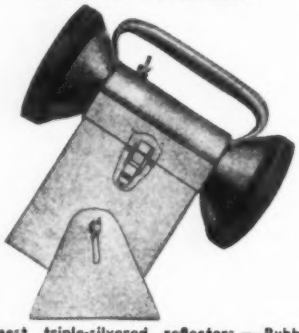
1 flood for nearby work
1 beam for overhead



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Uses 2 telephone type No. 6 cells—Height 11"—Weight 8½ lbs.

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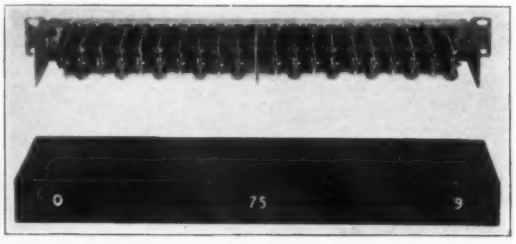

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Connecticut Tel. & Elec. combination central battery and magneto external post connection desk or hand set signal set with 3-bar generator and 1,000 ohm ringer wired to work with any standard 3-condition hand or desk set.....@	6.00
Automatic Elec. No. 426 desk set complete with No. 24 dial and either Molded Plastic or No. 500 enclosed gong signal set with anti-side tone induction coil.....@	12.00
Kellogg latest type No. 2800 4-bar 1000-1600 or 2500 ohm ringer compacts with short arm .....@	9.25
Stromberg-Carlson latest type No. 896 compacts 3-bar 1000-1600 or 2500 ohm ringer @ $7.50; 4-bar @ $8.75; 5-bar.....@	9.50
Western Elec. No. 46 C. B. induction coil @ $.50; No. 20.....@	.35

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FOR SALE

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FOR SALE: American Automatic RCX Switchboard Complete Central Office Equipment. 40 line board, 30 lines equipped. Been in service six years. In extra good condition. Price reasonable. P. O. Box 327, Florence, Kentucky.

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POSITION WANTED: Ambitious and capable executive type telephone man, graduate engineer, with fifteen years' Bell and Independent experience in supervision of large plant operation. Will consider offer where ability to produce results is required. Write No. 8975, care of TELEPHONY.

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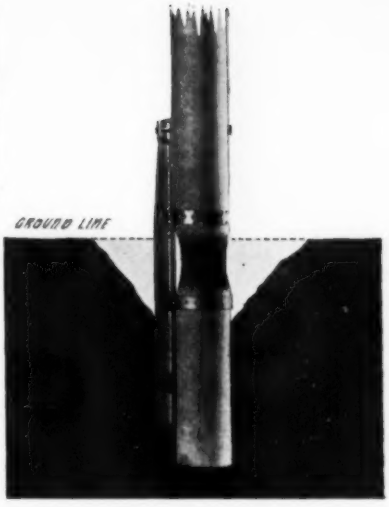

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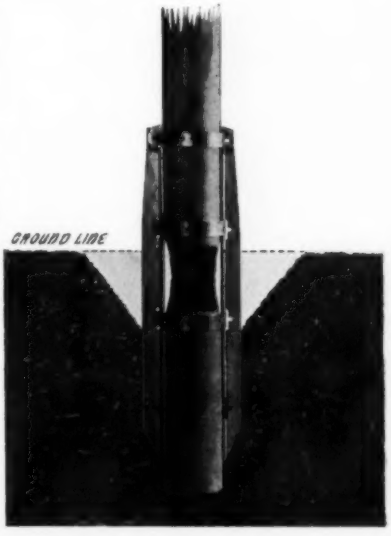

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